

INJECTABLE CATHETER AND METHOD OF PLACING SAME

DESCRIPTION

1. Technical Field

This invention relates to a catheter and, more particularly, to a catheter introducer device using a fluid placement medium and a method of placing said catheter.

2. Background Art

This invention relates to a catheter introducer for inserting a catheter into a passageway, such as a blood vessel. A catheter so inserted is commonly used to inject an intravenous solution or to keep blood vessels free from blockage.

Typical prior devices have required manual manipulation using sheaths and/or gloves to thread the catheter into place. On such device is shown in the Poncy et al U.S. Pat. No. 4,037,600, wherein a catheter is threaded through a V-shaped component after a special needle has been used to form a venipuncture. The catheter is retained in a flexible sleeve and is hand manipulated through the sleeve to thread the catheter into the passageway. The catheter must have some degree of stiffness in order to be threaded into the passageway and around bends and joints in the passageway. The catheter must not be too stiff so as not to cause damage to the passageway as it is manipulated into place.

Other threading devices are shown in the Bennet et al U.S. Pat. No. 3,825,001 and the Jewett U.S. Pat. No. 3,835,854 wherein a plastic sheath ('001) for a chamber ('854) are used to store the catheter prior to and during manipulation of the catheter in place.

All three above-identified patents provide for inserting the catheter at a non-constant rate which increases patient discomfort.

An improved apparatus was provided by the teachings of the Smith U.S. Pat. Nos. 3,703,174 and 3,826,256 wherein a very flexible catheter (wet noodle limpness) is inserted into a passageway by the use of an introducer needle and a fluid placed under pressure behind and between the juncture of the catheter and the needle cannula, which fluid propels the catheter into the passageway for a relatively great distance and at a relatively uniform rate. The catheters are stored in a coiled condition either in or out of a fluid solution such that, even though limp, the catheters have a tendency to stick together and/or to take a set creating insertion problems through the needle and threading problems in the passageway. That is, the tendency for the catheter to want to curl lengthwise causes hangups and blockages in the needle and, in the passageway, tends to curl toward the passageway wall which will slow down or stop the insertion of the catheter. Accordingly, exceptional care must be taken in manufacturing the Smith apparatus and the shelf life of the apparatus must be monitored to assure that catheters that have portions stuck together or have taken a set are removed before use.

The present invention is directed to overcoming one or more of the problems as set forth above.

DISCLOSURE OF INVENTION

This invention relates to a catheter introducer device wherein pressurized fluid is injected into the proximal end of a relatively stiff tubular component containing the catheter, thereby moving the catheter through the tube and attached introducer cannula into a body pas-

sageway. In effect, the catheter is flowed into the passageway by the fluid flowing around and along the outer surface of the catheter. The catheter has an enlarged segment at its proximal end which prevents the catheter from being completely injected into the passageway. The enlarged segment may be formed by an extrusion process or by injection molding, or the like, and may have an eyelet inserted in the enlarged segment to prevent collapse thereof and to assist in wedging the catheter in sealing relationship in the introducer cannula. The catheter is stored in the tube in a way that prevents portions of the catheter from sticking together and prevents the catheter from kinking during insertion in a body passageway.

The device further contains a Y component which enables the lumen of the introducer cannula to receive an introducer needle, easing introduction of the introducer cannula into the passageway while also permitting the withdrawal of the needle and introduction of the catheter into the introducer cannula while maintaining a sterile condition. By introducing the catheter and the needle through different forks of the Y component, a sterile seal may be maintained even as the needle is withdrawn from the introducer cannula and is replaced by the catheter.

An improved method is disclosed for introducing a catheter into a body passageway and for connecting an I.V. unit directly to the introducer cannula.

The device permits quick injection of a catheter with relatively little effort, thereby minimizing patient discomfort. Further, the components of the device may be inexpensively made and easily used. The device also permits separate insertion of the needle and catheter into the introducer cannula, thus allowing use of a conventional flashback vent plug with the needle to indicate proper placement in the passageway (i.e., blood vessel) while totally eliminating the problem of the needle point cutting the catheter in the passageway.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is an exploded perspective view of a tubular component with a catheter therein;

FIG. 2 is a view showing an introducer cannula placed in a body passageway with the needle removed from the introducer cannula;

FIG. 3 is a perspective view of one preferred embodiment of the invention showing the tubular component and catheter connected to the introducer cannula;

FIG. 4 is an enlarged partial view of the proximal end portion of the catheter with an eyelet in place therein;

FIG. 5 is a perspective view of an introducer cannula, Y component and needle showing the needle and cannula penetrating into a body passageway, such as a blood vessel;

FIG. 6 is a partially exploded perspective view of the device of FIG. 5 after withdrawal of the needle and prior to injection of the catheter;

FIG. 7 is a perspective view of the device of FIG. 5 after the catheter has been injected into the passageway or vessel;

FIG. 8 is a perspective view showing the catheter as in FIG. 7 with the Y component removed, the introducer cannula backed out of the venipuncture and taped to the skin and an I.V. line connected thereto;

FIG. 9 is an exploded view of a modification wherein the tubular component is attached directly to the Y component;